

Behind the Webb Episode 16 - Script

Almost two dozen countries are helping to build the James Webb Space Telescope. Canada is responsible for what some call the observatory's steering wheel, otherwise known as the Fine Guidance Sensor or FGS. The Canadians are also delivering one of the four scientific instruments on the telescope, the Near Infrared Imager and Slitless Spectrograph. To find out more about the FGS and NIRISS, we're here at the Canadian Space Agency's David Florida Laboratory in Ottawa, Canada.

So Karl, why did you want to meet here in a chamber?

Right now we're standing in front of the thermal vacuum chamber where we've tested the instruments in the vacuum of space and also the cold environment in which it's going to operate. So it's key for us to demonstrate that our system that has to be very sensitive but also have to be robust enough to survive the conditions of the mission.

Was there some other technology that helped develop the Fine Guidance and the NIRISS?

Yes, in fact our prime contractor, COMDEV Canada, developed some star tracking software for other missions and for missions that are currently ongoing. So we built on that heritage to build the software for this mission.

So were there any other challenges you had to overcome to build FGS and NIRISS?

In fact, our team is spread over 3 time zones so in order to keep communications flowing and also getting decisions in as real time as possible... That was a challenge but we had a good team, a team that really believed in the mission so we were very cohesive and we were able to overcome that.

I understand the FGS and NIRISS are actually here in the building.

That's right. This is their home and if you want, we can take a look at them in the tent.

Sounds good.

Good.

On the top here what we have is the Fine Guidance Sensor. It will basically point the telescope and keep the telescope stabilized so that we get really sharp images from that. And on the other side, we have NIRISS. One of the aspects of NIRISS that we're very excited about is that it has a particular capability to detect exoplanets. These are planets that are circulating around a star and hopefully, at the same time, detect if they have atmospheres and if they do have atmospheres, know exactly what these atmospheres contain. Is it capable of sustaining life.

Now I understand Fine Guidance has a redundancy built in, right?

That's right... the Fine Guidance Sensor has two cameras and both function the same way and if we have a problem with one of the channels, we can switch over to the other one and not lose any capability, any performance.

NIRISS, our science instrument, can also perform guidance functions. So it's like we have a third level of redundancy as part of the Canadian package.

Thank you, Carl, for showing us the Fine Guidance Sensor and the NIRISS. You're very welcome, Mary.

So there you have it... Canada's contribution to the James Webb Space Telescope. Thanks for joining us for yet another edition of Behind the Webb.